BIOLOGICAL EVALUATION PROPOSED, ENDANGERED, THREATENED, AND SENSITIVE (PETS) SPECIES

INTRODUCTION

As part of the NEPA decision making process, Forest Service programs or activities are reviewed to determine how they may affect any U.S. Fish and Wildlife Service Proposed, Endangered, Threatened, or U.S. Forest Service Sensitive species. The review is conducted to ensure that Forest Service actions do not contribute to a significant loss of species viability or cause a species to move toward federal listing. The review incorporates concerns for sensitive species throughout the planning process, reduces negative impacts to species, and enhances opportunities for mitigation. A biological evaluation (BE) is the means of conducting the review and documenting the findings (FSM 2672.41).

A biological evaluation consists of four steps: Step 1, Prefield Review of existing information to determine if there is evidence or potential for sensitive species and/or their habitats to occur within the area of the proposed project; Step 2, Field Reconnaissance of the project area to locate these species or their habitats; Step 3, Risk Assessment to evaluate the level of risk to species or habitats which may be impacted by the project; Step 4, if insufficient data exists to complete Step 3, a biological investigation may be required so that Step 3 can be completed; a Species Management Guide compiles the information gathered during a biological investigation. (FSM 2672.43)

This BE will address those species determined as sensitive, threatened, or endangered in Oregon by the Region 6 Regional Forester. The effects of the EA are discussed for all species except those not having habitat and/or not known to occupy the project area. General information on species distribution, habitat, and natural history was gathered from (1) Atlas of Oregon Wildlife (Csuti et al. 2001), (2) Mammals of the Pacific States (Ingles 1990), (3) Birds of the Pacific Northwest (Gabrielson and Jewett 1970), (4) Amphibians of Oregon, Washington, and British Columbia (Corkran and Thoms 1996), and (5) USDA Forest Service field records and biologist observations.

PRE FIELD REVIEW

The following proposed, endangered, threatened, or sensitive species (PETS) of wildlife are listed on the Regional Forester's Sensitive Species List (January 2011; Table 1). Only those PETS, or their habitats, known or suspected to occur in or immediately adjacent to the analysis area are addressed in this BE (Table 1).

Table 1. Proposed Endangered, Threatened or Sensitive species known or suspected to occur on the Wallowa-Whitman NF.

STATUS[1]	Species	WAW[2,3]	La Grande District[3]	East Face Project Area[4]	Addressed in this BE	Effects Determination[5]
	AMPHIBIANS					
Sen	Rocky Mt tailed frog *Ascaphus montanus*	**D**	K	P	X	MIIH
Sen	Columbia spotted frog *Rana luteiventris*	**D**	K	K	X	MIIH
	BIRDS					
Sen	Northern bald eagle *Haliaeetus leucocephalus*	**D**	K	N	X	MIIH
Sen	Ferruginous hawk *Bucephala albeola*	**S**	H	N		
Sen	American peregrine falcon *Falco peregrinus anatum*	**D**	K	N		
Sen	Black swift *Cypseloides niger*	**S**	N	N		
Sen	Harlequin duck *Histrionicus histrionicus*	**S**	N	N		
Sen	Black rosy finch *Leucosticte tephrocotis wallowa*	**S**	N	N		
Sen	Columbian sharp-tailed grouse *Tympanuchus phasianellus columbianus*	**D**	N	N		
Sen	Upland sandpiper *Bartramia longicauda*	**D**	K	N		
Sen	Greater sage grouse *Centrocercus urophasianus phaios*	**D**	K	N		
Sen	Lewis' woodpecker *Melanerpes lewis*	**D**	K	P	X	BI
Sen	White-headed woodpecker *Picoides albolarvatus*	**D**	K	K	X	BI
	MAMMALS					
T	Canada lynx *Felix lynx canadensis*	**D**	K	N	X	NI
Sen	North American wolverine *Gulo gulo luteus*	**D**	K	P	X	MIIH
Sen	Gray wolf *Canis lupus*	**D**	K	P	X	MIIH
Sen	Fringed myotis *Myotis thysanodes*	**D**	K	P	X	MIIH
Sen	Townsend's big-eared bat *Corynorhinus townsendii*	**D**	K	N		
Sen	Spotted bat *Euderma maculatum*	**S**	H	N		

	INVERTEBRATES					
Sen	Johnson's hairstreak *Callophrys johnsoni*	**D**	K	P	X	MIIH
Sen	Intermountain sulphur *Colia Christina pseudochristina*	**D**	P	P	X	MIIH
Sen	Silver-bordered fritillary *Boloria selene*	**S**	N	N		
Sen	Western bumblebee *Bombus occidentalis*	**D**	K	H	X	MIIH
Sen	Yuma skipper *Ochlodes yuma*	**D**	N	N		
Sen	Hells Canyon land snail *Cryptomastix populi*	**D**	N	N		
Sen	Fir pinwheel *Radiodiscus albietum*	**S**	H	H	X	MIIH

[1]T = Threatened; E = Endangered; C = Federal Candidate;Sen = Region 6 Sensitive.
[2]WAW= Wallowa-Whitman NF
[3]D = documented occurrence, S= suspected occurrence
[4] K = Known habitat; P = Potential habitat; N = No habitat
[5]**Listed species**: NE = No Effect, LAA = May Affect-Likely to Adversely Affect, NLAA = May Affect – Not Likely to Adversely Affect, BE = Beneficial Effect
Sensitive species: NI = No Impact, MIIH = May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species, WIFV = Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species, BI = Beneficial Impact

FEDERALLY LISTED SPECIES

CANADA LYNX (*Felix lynx canadensis*)

Lynx occur in coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (Ruediger et al. 2000). They are typically associated with large contiguous tracts of boreal or coniferous forest in Alaska and Canada, but are also found in high elevation spruce, subalpine fir, and lodgepole pine forests in the western United States. Vegetation that constitutes primary lynx habitat is subalpine fir where lodgepole pine is a major seral species, generally between 1,250-2,000 meters. Cool, moist Douglas-fir, grand fir, western larch, and aspen forests may also contribute to lynx habitat when interspersed with subalpine forests. Dry forest types (ponderosa pine, climax lodgepole pine) are not considered habitat. Hares, their primary prey, exploit early to mid-successional stages and lynx foraging habitat is mixed conifer stands characterized by a dense, multi-layered understory that maximizes hare browse at both ground level and at varying snow depths. Lynx prefer to move through continuous forest and frequently use ridges, saddles, and riparian areas. They commonly select mature forest with dense patches of downed trees for denning (Johnson and O'Neil 2001).

The Blue Mountains represent the southern extent of lynx distribution, which would explain the rarity of this species on the periphery of its range both historically and presently. Based on limited verified records, lack of evidence of reproduction, and occurrences in atypical habitat that

correspond with cyclic highs in Canada, lynx are through to occur in Oregon as dispersers that have never maintained resident populations. They are considered an infrequent and casual visitor by the State of Oregon (Ruediger et al. 2000). Lynx habitat in northeastern Oregon is categorized as a "peripheral area" meaning there is no evidence of long term presence, or reproduction that might indicate colonization or sustained use by lynx, but habitat may enable the successful dispersal of lynx between populations or subpopulations (Wallowa-Whitman National Forest Lynx Strategy Letter April 19,2007). The Forest conducted extensive winter track surveys for wolverine and lynx from 1991 – 1994 and 2 sets of possible lynx tracks were found on the Whitman Ranger District (Wolverine and Lynx Winter Snow Track Reports, 1991-92, 1992-93, 1993-94, Wallow-Whitman NF). One set was found during 1992-93 near the town of Bourne and the other set was found during 1993-94 near Gorham Butte. None of the hair collected from hair snares used for the National Forest Lynx Survey conducted on the Forest from 1999-2001 was identified as lynx. The Forest is considered "unoccupied" habitat; "occupied" habitat is defined as requiring at least 2 verified observations or records since 1999, or evidence of lynx reproduction (Wallowa-Whitman National Forest Lynx Strategy Letter April 19, 2007).

EFFECTS ANALYSIS

Action Alternatives (Discussion of these alternative is combined because the effects would be similar)- Any of the alternatives of this project would have **No Effect (NE)** to the Canada lynx because it is not considered present on the Forest (Wallowa-Whitman National Forest Lynx Strategy Letter April 19, 2007).

SENSITIVE SPECIES

Existing Condition of Populations and Habitat and Environmental Consequences

ROCKY MOUNTAIN TAILED FROG (*Ascaphus montanus*)

Habitat description- Tailed frogs are strongly adapted to cold water conditions. They occur in very cold, fast-flowing streams that contain large cobble or boulder substrates, little silt often darkly shaded, and less than 20 degrees C (Bull and Carter 1996). Tailed frogs develop very slowly in the cold water, and tadpoles are two to five years old before they metamorphose (Corkran and Thoms 1996), and 7 to 8 years before they reach adulthood. Tailed frogs lay their eggs in streams in summer, attaching them under cobbles or boulder sized rocks. Tadpoles cling to the undersides of moss-free small boulders or large cobbles. They are more likely to be found lower in a stream than adults.

Bull and Carter 1996 sampled 80 streams within northeastern Oregon in 1992. They found that stream characteristics were more important than landscape characteristics in predicting the abundance of tailed frogs. They found no significant differences in numbers of larvae or adults when comparing streams with low, moderate, or heavy amounts of timber harvest. Larval abundance was best predicted by the percentage of cobble and fines in the stream. The percentage of cobble and boulders in the stream, the amount of a 2000 m stretch of stream with a buffer, and then stream gradient were the best predictors of adult abundance.

Existing Condition- Tailed frogs are not known to occur in the project area but there are high gradient streams within the project area that could provide suitable habitat.

Direct/Indirect Effects

Alternative1- Under Alternative 1, the risk of wildfire or disease/insect outbreaks would continue to increase over time because there would be no changes to stand stocking levels or fuel loads from active management. Wildfires could affect tailed frogs and their habitat by burning through riparian areas and removing existing vegetation that is currently providing bank stability and preventing erosion and sedimentation.

Assuming no uncharacteristic wildfires or disease/insect outbreaks, there would be no effect to tailed frogs other than potential benefits, including stream shading and lowered stream temperature from increased densities of trees along channels. Current fine sediment levels would likely be maintained in the short term because current management activities would continue.

Action Alternatives- Discussion of the alternative is combined because the effects of the alternatives would be the same. Standard INFISH RHCA widths will be utilized to protect aquatic habitat from measurable increases in fine sediment. All commercial timber harvest activities are proposed for areas outside of RHCA's.

Proposed burning activities will result in a low severity fire in RHCAs adjacent to perennial streams in the project area. This will be accomplished by burning when fuel moisture levels are high, not actively lighting fires in RHCAs, and allowing fires to back into RHAs from adjacent upslope areas. These techniques result in low intensity fires that burn in a patchy distribution of burned and unburned areas in RHCAs. The proposed burning in RHCAs adjacent to intermittent streams poses little risk of increasing stream temperatures because these streams are normally dry during the summer and fall months.

The combination of new temporary road construction and decommissioning, and log haul traffic will likely result in an increase in erosion rates in the analysis area in the short-term. INFISH RHCAs will likely moderate much of the increase and the amount of sediment reaching stream channels will likely result in an immeasurable increase in fine sediment levels in streams in the analysis area for aquatic species.

Cumulative Effects

Past activities that have affected rocky mountain tailed frog habitat include grazing, fire suppression and logging and have been incorporated into the existing conditions. Ongoing and future livestock grazing is expected to be maintained at the current level and have minimal effect on suitable habitat. Road maintenance is an ongoing activity throughout the project area. Short-term effects from road maintenance are minimized by INFISH standards and guides. In the long-term, road maintenance reduces adverse effects to aquatic habitat by reducing overall erosion rates. Any additional increase in fine sediment from implementation of East Face action alternatives will not contribute to any measurable effects on spotted frog habitat quality because sediment will

remain below the 20% threshold. The East Face project will not contribute to cumulative effects for the rocky mountain tailed frog.

Determination

The East Face project area may be inhabited by tailed frogs. However, none of the proposed activities in any of the action alternatives will degrade or impact potential habitat for this species. Any of the action alternatives may impact individual frogs (**MIIH**) but would not likely lead to a downward trend in the population or trend toward federal listing.

COLUMBIA SPOTTED FROG (*Rana luteiventris)*

Habitat description- This species is found at aquatic sites in a variety of vegetation types, from grasslands to forests (Csuti et al. 2001). It is highly aquatic and is usually near cool, permanent, quiet water. It is found in marshes, wet meadows, permanent ponds, lake edges, and slow streams with non-woody wetland vegetation, but may move considerable distances after breeding. Breeding occurs in shallow water at pond edges, stream margins, and in inundated floodplains. Egg masses are free floating and tadpoles live in the warmest parts of the water. Springs maybe used as over-wintering sites for local populations of spotted frogs.

Occurance information- A study conducted from 1997-2004 in northeastern Oregon found that the frog is widely distributed throughout northeastern Oregon where permanent ponds and rivers or creeks occur, and that although populations are generally not large, numerous small ones occur, particularly when connected by flowing water (Bull 2005).

EFFECTS ANALYSIS

Alternative 1- Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels (currently overstocked) or fuel loads from active management. Assuming no uncharacteristic wildfire or disease/insect outbreaks conifer encroachment on meadows and over streams could lower water temperature on breeding ponds, reducing habitat for spotted frogs. Uncharacteristic wildfires could affect spotted frogs and their habitat by burning through riparian areas and removing existing trees, aspen, and other riparian vegetation that is currently shading streams, preventing erosion and sedimentation, and keeping banks stable. The impact to spotted frogs would depend on the size and severity of the disturbance.

Action alternatives (Discussion of these alternative is combined because the effects would be similar) – There would be no effects to spotted frogs from commercial treatment activities because all treatment activities would be more than 300 feet from any perennial/fish bearing streams, more than 150 feet from any perennial/non-fishbearing streams, and more than 50 feet from any intermittent streams. No treatments are proposed near known spotted frog breeding areas. Prescribed fire would be allowed to back-burn inside project specific buffer, but would likely be low intensity due to moist conditions and would result in a mosaic of burned patches with areas of undisturbed ground, having little effect on riparian conditions.

Cumulative effects

Past activities that have affected spotted frog habitat include grazing, fire suppression and logging and have been incorporated into the existing conditions. Ongoing and future livestock grazing is expected to be maintained at the current level and have minimal effect on suitable habitat. Road maintenance is an ongoing activity throughout the project area. Short-term effects from road maintenance are minimized by INFISH standards and guides. In the long-term, road maintenance reduces adverse effects to aquatic habitat by reducing overall erosion rates. Any additional increase in fine sediment from implementation of East Face action alternatives will not contribute to any measurable effects on spotted frog habitat quality because sediment will remain below the 20% threshold. However, there may be a cumulative impact on direct mortality of dispersing individuals with improved road maintenance and subsequent increased speed and traffic.

Determination- *Common to all alternatives*- These alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

LEWIS WOODPECKER (*Melanerpes lewis*)

Habitat Description- This woodpecker is associated with open woodland habitat, often at lower elevations, near water (Marshall et al. 2003). In Oregon, it breeds primarily in white oak, ponderosa pine, and riparian cottonwood communities of the river valleys of eastern Oregon, and winters in oak savannah (Csuti et al. 2001, Marshall et al. 2003). Important components of breeding habitat include an open woodland canopy and large diameter dead or dying trees. Large, stand replacement fires in ponderosa pine along streams and rivers provide important nesting habitat for this species. Nest sites are usually near streams, wet meadows or dense shrub cover where insects are abundant. It winters in oak savannah. Unlike most woodpeckers, the Lewis' does not peck at wood for food but catches insects by flycatching and gleaning during spring and summer. It feeds on ripe fruits and acorns during fall and winter.

Occurrence information- No surveys have been specifically conducted for the Lewis woodpecker, however incidental sightings have been reported along the Grande Ronde River. No sightings have been recorded within the project area boundary. While its presence in the project area is unknown, the presence of ponderosa pine forest indicate potential habitat may exist. It may occur in the ponderosa pine country along Wolf Creek. The project area is deficient in Old Forest Multi Story (OFMS) and almost completely lacking in Old Forest Single Story (OFSS) which is characteristic of old ponderosa pine forests. Large ponderosa pine, western larch and Douglas-fir snags are uncommon in the project area because of past timber management, road building and firewood cutting. Snags >21" dbh are deficient over most of the project area.

EFFECTS ANALYSIS

Alternative 1- Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Conversely, wildfire would likely also

produce snags, but newly created snags are usually hard and not easily excavated. Sound live trees that are killed by fire do not contain the rot and defects that exists in snags and logs that die more slowly from other causes. The impact to habitat would depend on the size and severity of the disturbance.

Action Alternatives (Discussion is combined because effects would be similar) – In the short term, disturbance from treatment activities might cause individual birds to shift spatially, but these alternatives would increase the potential of the project area to provide habitat. The proposed treatments (removing small trees, retaining big trees, underburning) for these alternatives would help in dry forest restoration and over the long term would move the project area toward open stands of single-story, mature ponderosa pine and douglas fir. Treatments in potential Lewis woodpecker habitat would begin to restore dry OFSS by removing smaller trees to promote the desired development of large ones. Alternative 2 and 5 would create the highest acreage of OFSS, moving the HRV from 3% on the landscape to 10%. Alternative 4 would create the least, moving the landscape to 7%. Activities would reduce tree densities but increase the rate of development of the large trees needed by Lewis' woodpeckers. Nest failure and individual loss of nesting young is possible, but expected to be low risk to populations. Timber harvest treatments would have the low potential to reduce snags on the landscape in the short-term. Long-term reductions in potentially available burned habitat are expected, but would be offset by a relatively steady availability of suitable green stands. In the long-term, maintenance burning would reduce shrub availability temporarily, but shrub growth and development that support insect prey populations is expected to occur between burning treatments.

Cumulative effects

Past activities that have affected Lewis woodpecker habitat include grazing, fire suppression, prescribed fire, logging and woodcutting and have been incorporated into the existing conditions Lewis' woodpeckers have relatively small home ranges (15 acres, Thomas 1979) and the cumulative effects are analyzed at the project level. Ongoing and future activites that may impact Lewis' woodpecker habitat is grazing. Grazing has the potential to reduce shrub presence in suitable stands, but the predicted degree of impact is unknown. This effect is not expected to be significant. The East Face project is not expected to contribute to cumulative effects for the Lewis Woodpecker.

Determination – *Common to all alternatives*- These alternatives are expected to have a **Beneficial Impact (BI)** on the species through habitat creation**.**

WHITE-HEADED WOODPECKER (*Picoides albolarvatus*)

Habitat description- This woodpecker is closely associated with open ponderosa pine or mixed conifer dominated by ponderosa pine (Csuti et al. 2001). Although most abundant in uncut old-growth forest stands, white headed woodpeckers will use areas where silviculture treatments provide sufficient densities of large-diameter ponderosa pines. It requires large trees for foraging and snags for nesting (Csuti et al. 2001). An Oregon study found that they spent most of their time foraging in trees greater than 20 inches in diameter and nest trees averaged 18 inches in diameter. Nest sites are usually excavated in snags but can also occur in stumps, leaning logs, and dead tops

of live trees. It is the only woodpecker that relies heavily on ponderosa pine seeds for food. It forages on the trunks, branches, and foliage of large-diameter ponderosa pine for pine seeds and insects. It rarely drums or taps and feeds by scaling back off trees to reach insects underneath.

Occurrence information- The white-headed woodpecker is an uncommon permanent resident in forests of the Ochoco, Blue, and Wallowa Mtns. Past, present, and ongoing habitat loss pose a threat to the continued existence of the species throughout its range (Wisdom et al. 2000). The amount of old-growth ponderosa pine left in Oregon is unknown, but it is probably less than 10% of what occurred in pre-European settlement (Marshall 1997). Among the most significant and greatest declining wildlife habitat in the Interior Columbia Basin is late and old-growth forest structure. Wisdom et al (2000) concludes that source habitat for most species declined strongly from historical to current periods across large geographic areas, that the steepest declines were for species dependent on low elevation, old forest habitats, and that the white-headed woodpecker has experienced the sharpest reduction of any species associated with late and old forest habitat. Much of the remaining late and old forest structure exists in isolated remnant stands. The loss has occurred mainly through a combination of timber harvest, road building, and wildlife. Motorized access into these areas increases the potential for disturbance and habitat fragmentation, and reduces habitat quality through the removal of snags and logs by firewood cutters (Wisdom et al 2000). White-headed woodpecker surveys were conducted in suitable habitat along the North-east portion of the project boundary and along the southern edge of Wolf Creek. One white-headed woodpecker responded to audio callbacks.

EFFECTS ANALYSIS

Alternative 1- Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Conversely, wildfire would likely also produce snags, but newly created snags are usually hard and not easily excavated. Sound live trees that are killed by fire do not contain the rot and defects that exists in snags and logs that die more slowly from other causes. The impact to habitat would depend on the size and severity of the disturbance.

Action Alternatives (Discussion is combined because effects would be similar) – In the short term, disturbance from treatment activities might cause individual birds to shift spatially, but these alternatives would increase the potential of the project area to provide habitat. The proposed treatments (removing small trees, retaining big trees, underburning) for these alternatives would help in dry forest restoration and over the long term would move the project area toward open stands of single-story, mature ponderosa pine and Douglas fir. Treatments in potential White-headed woodpecker habitat would begin to restore dry OFSS by removing smaller trees to promote the desired development of large ones. Activities would reduce tree densities but increase the rate of development of the large trees needed by white headed woodpeckers. Alternative 2 and 5 would create the highest acreage of OFSS, moving the HRV from 3% on the landscape to 10%. Alternative 4 would create the least, moving the landscape to 7%.

Cumulative effects

Past activities that have affected white-headed woodpecker habitat include grazing, fire suppression, prescribed fire, logging and woodcutting and have been incorporated into the existing conditions White-headed woodpecker home ranges are moderate in size, averaging about 257-524 acres in old-growth habitat (Dixon 1995) and the cumulative analysis was analyzed at the project scale. Ongoing and future activities that may affect white-headed wodpeckers is grazing. Livestock grazing has the potential to limit shrub densities which may reduce risk due to nest predation, but the degree of benefit is unknown. Timber harvest on private lands within and adjacent to the project area is expected to continue with anticipated reductions of tree larger than 10 in. DBH. None of these effects are expected to be significant because they are not likely to impact habitat availability at this scale. The East Face project is not expected to contribute to cumulative effects to white-headed woodpeckers.

Determination – *Common to all alternatives*- These alternatives are expected to have a **Beneficial Impact (BI)** to this species due to habitat creation.

NORTH AMERICAN WOLVERINE (*Gulo gulo luteus)*

Habitat description- Wolverines in the southern portion of their range utilize high-elevation alpine portions of Washington, Idaho, Montana, Wyoming, and Colorado. They do not appear to need specific vegetation or geologic habitat features, but instead select for areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow into the warm season. Mean seasonal elevations used by wolverines in the Northern Rocky Mountains and North Cascades vary between around 4,600 and 8,500 ft. depending on location, but are always relatively high on mountain slopes. In the contiguous United States, valley bottom habitat appears to be used only for dispersal movements and not for foraging or reproduction (Federal Registrar 2013).

Wolverines are not thought to be dependent on vegetation or habitat features that may be manipulated by land management activities. They have been documented using both recently logged areas and burned areas. It is unlikely that wolverine avoid the type of low-use roads that generally occur in wolverine habitat (Federal Register 2013). The best scientific information available does not substantiate dispersed recreational activities (even at high levels) as a threat to the wolverine population (Federal Register 2014). Additionally, the scale at which most land management decisions (including Forest Service vegetative management activities) occur is relatively small compared to the average size of a wolverine home range and although impacts to individual animals may occur, they do not rise to the level to be a threat to the population (Federal Register 2014). While there are no definitive effects currently known at the population level, there are on-going scientific investigations to better understand potential recreational impacts to wolverine.

Deep, persistent, and reliable spring snow cover (April 15 to May 14) is the best overall predictor of wolverine occurrence in the contiguous United States. Wolverine year-round habitat use takes place almost entirely within the area defined by deep, persistent spring snow. This is likely related to the wolverine's need for deep snow during the denning period. No records exist of wolverines denning anywhere but in snow, despite the wide availability of snow-free denning opportunities within the species range. The deep, persistent spring snow layer in the Copeland *et al.* (2010) model captures all known wolverine dens in the DPS (Federal Registrar 78). However, it should

be noted that this model depicts areas that are snow covered through May 15 in at least 1 out of 7 years. Additionally, except for denning females (denning habitat is not considered scarce or limiting to wolverine reproduction), wolverines are occasionally observed in areas outside the modeled deep, persistent snow zone, and factors beyond snow cover may play a role in overall wolverine distribution (Federal Registrar 19).

On February 4, 2013, the U.S. Fish and Wildlife Service proposed to list the distinct population segment of the North American wolverine occurring in the contiguous United States, as a threatened species under the Endangered Species Act. On August 13, 2014, the USFWS withdrew its proposal to list the wolverine under the Endangered Species Act. As a result of this action, the wolverine automatically returns to the R6 Sensitive Species list.

Occurrence information- Adjacent wilderness areas including the Eagle Cap and North Fork John Day Wilderness are the nearest potential natal denning sites. Snow tracking surveys conducted across the Forest (since 1990's) for wolverine, fisher, American marten and lynx have found no possible wolverine tracks in or near the project areas. There have been no confirmed observations of the wolverines within or near the East Face project area.

EFFECTS ANALYSIS

Alternative 1- Wolverines are habitat generalists and effects to wolverines from this alternative would be related primarily to potential effects to prey species. Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, small mammals and deer and elk would likely continue to benefit from dense stands. In uncharacteristic wildfire or disease/insect outbreaks occurred, the condition of habitat for prey species would likely decline due to a loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of overstory cover would represent a long-term reduction. Deer and elk would lose cover habitat, but would likely benefit from the trade-off of increased forage opportunities. The impact to prey would depend on the size and severity of disturbance.

Action Alternatives (Discussion is combined because effects would be similar) - The wolverine may periodically pass through portions of this analysis area, but the area does not support a breeding population. The rationale for addressing wolverine in regard for this project is the presence of wolverine in the Eagle Cap wilderness to the northeast of the project area and the large home range of this species. Prescribed fire activities and stand thinning are not expected to reduce habitat suitability for wolverines. The effects to prey species would likely be minimal because activities would not change the potential of the area to provide habitat for prey species. Thinning and prescribed burning would decrease cover for deer and elk, but cover standards for big game would be met. Decreases in cover would increase the quantity and quality of available forage. In the long term, amounts of cover would be restored to historic conditions appropriate for the capabilities of the landscape because structural stages would move toward historical proportions.

Cumulative effects

Wolverines have large home ranges, estimated from studies in central Idaho to range from 26,000 to 128,000 acres (Banci 1994), corresponding to a cumulative effects analysis area encompassing the project area and lands within a distance of 4.5 miles. Wolverines are not thought to be dependent on vegetation or habitat features that may be manipulated by land management activities. They have been documented using both recently logged areas and burned areas. Treatment of the project area would initiate the return of all structural stages to within historical proportions and consequently provide habitat for prey species according to historical conditions. Therefore, there would be no cumulative effects on wolverines and their prey from the proposed vegetation treatments.

Determination- ***Common to all alternatives*****-** With the consideration that the USFWS has determined management activities are not significant to the conservation of the species, given its extremely large home range, the alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

GRAY WOLF *(Canis lupis)*

Habitat description- Considered a habitat generalist, gray wolves occupy a wide range of habitats where there's an adequate prey base and human interference is low (Mladenoff et al. 1995). Historically, they occupied grasslands, sagebrush steppe, coniferous and mixed forest and alpine areas. Wolves prefer fairly large tracts of roadless country containing a mix of forested and open areas with a variety of topographic features (Witmer et al. 1998). The Northern Rocky Mountain Wolf Recovery Plan consider the key components of wolf habitat to be 1) a sufficient, year-round prey base of ungulates (big game) and alternative prey, 2) suitable and somewhat secluded denning and rendezvous sites and 3) sufficient space with minimal exposure to humans (U.S. Fish and Wildlife Service 1987). The size of wolf home ranges vary greatly across and among different regions, with ranges being reported at 94 km^2 in Minnesota and 13 $km^{2\ in}$ Alaska (Mech 1970) respectfully, and size and location are determined primarily by prey base (Witmer et al. 1998). Wolves have been shown to avoid densely roaded areas and areas with high human population density (Fuller et al. 1992, Mladenoff et al. 1995). Human caused mortality may be the largest limiting factor in the recovery of wolf populations across their range (Mech 1989, Pletscher et al. 1997).

Wolves were extirpated from Oregon by the mid-19^{th} century, with the last paid bounty occurring in 1946 (Marshal et al. 1996), and are currently listed as endangered on both the federal and Oregon state endangered species lists. Wolves in the northern Rocky Mountains (Oregon, Idaho, Montana, Wyoming, eastern Washington, and northern Utah) have continued to increase annually since the initial reintroductions took place in 1995. As of December 31, 2009 there were at least 1706 wolves in 242 packs in the northern Rocky Mountains (U.S. Fish and Wildlife Service et al. 2010). These numbers are about 5 times higher than the minimum population recovery goal and 3 times higher than the minimum breeding pair recovery goal. Minimum recovery goals (an equitably distributed northern Rocky Mountain wolf population that never goes below 100 wolves and 10 breeding pairs in Montana, Idaho, and Wyoming) have been exceeded every year since 2002 (U.S. Fish and Wildlife Service et al. 2010).

Occurrence information- As of 2014 there are eight known wolf packs in northeastern Oregon that are currently being monitored by the Oregon Department of Fish and Wildlife. The minimum population estimate is based solely on wolves that staff verified through direct evidence (data from radio collared wolves, visual observation, remote camera footage etc.) The actual number of wolves in Oregon is likely greater than this minimum estimate. Currently no packs are known to occupy habitat on the western side of I-84 where the project area lies, however at least one lone wolf has been identified traveling through the project area (personal communication ODFW 2015).

DIRECT/INDIRECT EFFECTS ANALYSIS

Alternative 1- Primary management concerns for the WWNF are 1) disturbance to denning wolves or rendezvous sites when pack numbers are low, and 2) providing adequate habitat for populations of prey species such as elk. Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, small mammals and deer and elk would likely continue to benefit from dense stands. In uncharacteristic wildfire or disease/insect outbreaks occurred, the condition of habitat for prey species would likely decline due to a loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of overstory cover would represent a long-term reduction. Deer and elk would lose cover habitat, but would likely benefit from the trade-off of increased forage opportunities. The impact to prey would depend on the size and severity of disturbance.

Action Alternatives (Discussion is combined because effects would be similar) –Wolves may periodically pass through portions of this analysis area, but the area does not support a breeding population. The rationale for addressing wolves in regard for this project is the presence of wolves within the eastern part of the forest and the large home range of this species. Prescribed fire activities and stand thinning are not expected to reduce habitat suitability for wolves. The effects to prey species would likely be minimal because activities would not change the potential of the area to provide habitat for prey species. Thinning and prescribed burning would decrease cover for deer and elk, but cover standards for big game would be met. Decreases in cover would increase the quantity and quality of available forage. In the long term, amounts of cover would be restored to historic conditions appropriate for the capabilities of the landscape because structural stages would move toward historical proportions.

Cumulative effects

The home range of a colonizing wolf population can average 301^2 miles (Bangs and Fritts 1993) with dispersal movements up to 522 miles (Boyd and Pletscher 1999). For the cumulative analysis, the whole forest was considered in the analysis area. With the exception of specific activities taking place at future den sites, the only activity with potential cumulative impacts to wolves would be the implementation of the Forest Travel Management Plan (TMP). The selected TMP alternative could have a positive effect on the distribution of elk, a primary prey resource, for wolves. The TMP preferred alternative will reduce density of designated motorized routes across the forest as well as preclude cross-country travel. Reduced road densities would distribute elk

across seasonal ranges during the proper season and may reduce the likelihood of wolves coming into contact with livestock on private lands.

Determination- ***Common to all alternatives***- The alternatives will have **No Impact (NI)** to the gray wolf.

FRINGED MYOTIS (*Myotis thysanodes*)

Habitat Information- The fringed myotis ranges through much of western North America. It primarily occurs from sea-level to 9348 f, but is primarily found at middle elevations (3936-6888ft). Distribution is patchy. It appears to be most common in drier woodlands (oak, ponderosa pine) but is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe (OOFarrel et al. 1980). They are known to roost in crevices in buildings, underground mines, rocks, cliff faces, and bridges but roosting in decadent trees and snags, particularly large ones, is common throughout its range. The fringed myotis has been documented in a large variety of tree species and it is likely that structural characteristics (e.g. height, decay stage) rather than tree species play a greater role in selection of a snag or tree as a roost (Weller and Zabel 2001). This myotis feeds on a variety of invertebrate taxa. The two most commonly reported orders in its diet are beetles and moths, however several potentially flightless taxa such as harvestmen, spiders, and crickets have been found in its diet. The presence of non-flying taxa in its diet indicates that they may glean prey from vegetation in addition to capturing prey on the wing. The potential to glean prey in concert with its wing-loading, flight style, morphological adaptations of wing and tail membranes, and design of its echolocation call indicate that the fringed myotis is adapted for foraging within forest interiors and along forest edges. The main threats for long term persistence of the fringed myotis is the loss or modification of roosting habitat. Removal of large blocks of forest or woodland habitat may also threaten the species due to its apparent propensity for foraging in and around trees (Bradley and Ports 1998).

Occurrence Information- There is no known records of fringed myotis in the project area. There are no known roost sites, or hibernacula or maternity colonies in the project area. While its occurrence in the project area is unknown, the presence of ponderosa pine forest and permanent water indicate potential habitat may exist.

EFFECTS ANALYSIS

Alternative 1- Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, this alternative would limit habitat by perpetuating overstocked stand conditions. Thinning stands typically benefits bats by increasing flight space in the stand and by promoting herbaceous growth for insect prey by increasing the amount of sunlight reaching the forest floor (Taylor 2006). Fire can also improve foraging space and travel corridors by decreasing tree density and increasing opening, and can increase insect prey diversity and abundance by increasing plant growth. If uncharacteristic wildfire or disease/insect outbreaks occurred, the impact to habitat would depend on the size and severity of disturbance.

Action Alternatives (Discussion is combined because effects would be similar)- If fringed myotis occur in the project area, mechanical treatments and/or smoke from prescribed fire could result in the deaths of individual bats or cause them to shift spatially when foraging, but these treatments would also likely create habitat. Thinning stands typically benefits bats by increasing flight space in the stand and by promoting herbaceous growth for insect prey by increasing the amount of sunlight reaching the forest floor (Taylor 2006). Fire can also improve foraging space and travel corridors by decreasing tree density and increasing openings, and can increase insect prey diversity and abundance by increasing plant growth. Roosting habitat would not be significantly effected as no snags $\geq$ 9" dbh or trees > 21 dbh (these trees represent future large snags) would be cut unless identified as imminent danger trees.

Cumulative effects

Commercial treatments within the EWA and adjacent private land have the potential to reduce snag densities, making myotis habitat on National Forest Land even more important to conserve.

Determination- ***Common to all alternatives*-** The alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

JOHNSON'S HAIRSTREAK (*Callophrys johnsoni)*

Habitat description- Johnson's hairstreak butterfly is characteristic of mature to old growth conifer in the Pacific Northwest. Johnson's Hairstreak is also sometimes called the Mistletoe Hairstreak because the larvae of this butterfly feed exclusively on the aerial shoots of dwarf mistletoe, which is a highly specialized and adapted parasitic plant of a number of conifers. This may limit the butterflies' occurrence and distribution to trees in stands that are affected with dwarf mistletoe. This species is believed to spend the majority of its time in the top of the forest canopy. The Blue Mountains do not host western hemlock and the forests are much drier and more open than the places Johnson's hairstreaks have been found to the west. While much of the literature indicates that this butterfly is dependent on large, old, closed-canopy old-growth (Miller & Hammond, 2007; Pyle, 2002), this is based on collections and sightings in the moist fir/hemlock forests of the Cascades and West Coast. Forests providing western dwarf mistletoe (*Arceuthobium campylopodum*) habitat in the Blue Mountains are typically open to provide sun that allows ponderosa pine to regenerate.

The distribution is largely restricted to the Pacific Northwest. Dwarf mistletoe infected conifers are common in northeastern Oregon, and current dwarf mistletoe levels are not believed to be substantially less than historic levels in this area.

Hessburg and others (1999) investigated changes from historical to current insect and disease vulnerabilities of selected sub-basins within the Columbia River Basin, including sub-basins in the Blue Mountains Ecological Reporting Unit, which covers the area reported to host Johnson's

Hairstreak. This is probably the best available data for approximating changes from historical to current insect and disease occurrence at the watershed level.

These authors found that the area of patches vulnerable to Douglas-fir dwarf mistletoe disturbance increased by 63 percent from 10.1 to 16.5 percent, with patch density more than doubling from 9.3 to 19.6 patches per 10,000 ha, and mean patch size increasing from 87.5 to 125.7 ha (Hessburg 1999).

Area and connectivity of patches vulnerable to lodgepole pine dwarf mistletoe disturbance increased slightly. Percentage of area increased by 7 percent from 1.5 to 1.6 percent, with patch density increasing from 2.9 to 4.0 patches per 10,000 ha, and mean patch size increasing from 21.5 to 21.8 ha.

Area and connectivity of patches vulnerable to western (ponderosa pine) dwarf mistletoe disturbance declined. Percentage of area declined by 22 percent from 10.4 to 8.1 percent, with patch density increasing from 9.6 to 12.7 patches per 10,000 ha, and mean patch size decreasing from 83.8 to 59.8 ha.

Area and connectivity of patches vulnerable to western larch dwarf mistletoe disturbance declined. Percentage of area declined by 38 percent from 1.3 to 0.8 percent, with patch density increasing from 1.8 to 3.6 patches per 10,000 ha, and mean patch size decreasing from 16.0 to 9.8 ha.

These changes from historical dwarf mistletoe vulnerability reflect the changes in area of the various host species. The widespread logging of seral ponderosa pine and larch trees has reduced their dominance on the landscape. Ponderosa pine now occurs less frequently in single species or ponderosa pine-dominated stands and now occurs more frequently in mixed species stands. In shade-tolerant species such as hemlocks and true firs dwarf mistletoes can intensify and cause severe infections. However ponderosa pine will not regenerate in dense stands, thus ponderosa pine dwarf mistletoe decreases as stands become denser and less shade tolerant.

The additional removal of widespread fire has promoted the regeneration and growth of Douglas-fir and true firs in many stands previously dominated by ponderosa pines and larch. This has increased the occurrence and severity of Douglas-fir dwarf mistletoe in the Blue Mountains. However, since it is not likely a preferred host for the Johnson's hairstreak, this trend may be reducing its habitat.

The Hessburg analysis reveals the slow decline of dwarf mistletoe-infected ponderosa pine through the loss of much of the pine overstory and the encroachment of shade-tolerant species into once pine-dominated stands. The maintenance of healthy populations of Johnson's hairstreak requires the maintenance of ponderosa pine (and possibly western larch) along with their associated dwarf mistletoes.

Occurrence information- There are 52 records in Oregon with the majority from 3,500 to 6,000 feet in elevation and west of the Cascade Range. A disjunct population is thought to be isolated in the Hells Canyon region of northeast Oregon and adjacent to Idaho. There are a few records south of the project area in Baker County (Schmitt and Spiegel 2008). Additional local sightings are

needed to document its range. It is unknown if this species occurs within the project area, however the species of mistletoe Johnson's hairstreak depends on is abundant throughout the forest and indicates potential habitat is available.

EFFECTS ANALYSIS

Alternative 1 – Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. The amount of mistletoe would not be impacted in the short term, however, large stand replacing fires do have the potential to reduce available habitat for this species (James and Nunnallee 2011). The impact to habitat would depend on the size and severity of the disturbance.

Action Alternatives (Discussion is combined because effects would be similar) – Under the action alternatives some trees that contain mistletoe would be removed to increase the health of the stands However, mistletoe is abundant within the project area and the level of trees removed will not significantly reduce the availability of host plants for this species. The action alternatives over the long term is likely to have a beneficial impact by promoting pine and larch regeneration and their associated dwarf mistletoes over a greater area than it currently occurs.

The use of the bacterium *Bacillus thuringiensis* var. *kurstaki* to combat defoliators in western forests is lethal to many butterfly and moth larvae when consumed. Use of BTK in Johnsons Hairstreak habitat is discouraged (Larsen et al. 1995), and the alternatives do not propose to use BTK in the project area.

Cumulative effects- Past activities that have affected Johnson's hairstreak habitat include grazing, fire suppression, prescribed fire, logging and woodcutting and have been incorporated into the existing conditions. Commercial treatments on the EWA and adjacent private lands are likely to target mistletoe infected trees, reducing Johnsons Hairstreak habitat. However dwarf mistletoe habitat is considered common and comparable to historic levels in the area and is likely to remain well-distributed in lightly infected leave trees, in areas where low severity fire does not kill trees and in riparian areas. The East Face project is not expected to contribute to cumulative effects.

Determination- ***Common to all alternatives*****-** The alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

INTERMOUNTAIN SULPHUR (*Colia Christina pseudochristina)*

Habitat information- The Intermountain sulphur butterfly inhabits open woodland from 3400 to 5000 ft., including meadows, roadsides, and open forest. James and Nunnallee (2011) states that members of this subspecies are most often found on steep sunny slopes at the ecotone between forest and shrubsteppe or grassland habitats with scattered Ponderosa Pine. Depending on seasonal conditions, adults of this subspecies fly mostly in late May, peaking in June through July. This subspecies overwinters in the larval stage and while in that stage feeds on Lathyrus species (sweet-

pea). This plant is normally found in drier habitat (Ponderosa pine and douglas fir). Adults use a variety of plants as nectar sources (Opler 2006). Loss of habitat due to agricultural conversion and development are the primary threats to this species with pesticide use as a close second. (Personal communication, Blue Mountains Pest Management Service Center).

Occurrence information- . It is found from the eastern Blue Mountains in Washington, through the Blue and Ochoco Mountains in Oregon and there have been numerous sightings in the Wallowa mountains. Though there has been no surveys conducted in the project area, the presence of grasslands and Ponderosa Pine indicate there is potential habitat.

EFFECTS ANALYSIS

Alternative 1 – Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Large stand replacing fires do have the potential to reduce available habitat in the short term for this species (James and Nunnallee 2011). The impact to habitat would depend on the size and severity of the disturbance.

Action Alternatives (Discussion is combined because effects would be similar) Silviculture and fuels management treatments under the alternatives would not impact the life cycle of this butterfly. No treatments are planned within grassland areas. Removing small trees and opening up stands in the dry forest could have the positive impact of creating more habitat for the species. Spring burning has the potential for direct mortality for the species as well as removing food sources for larvae and adults in the short term.

Cumulative effects- Past events that affected potential intermountain Sulphur habitat include grazing and fire suppression and have been incorporated into the existing conditions. Previous grazing was more intensive with higher stocking levels and longer season of use than what currently occurs. Present and proposed activities within the project area with a potential to affect Intermountain Sulpher are livestock grazing. The effects of present activities when combined with past activities, will maintain the current habitat conditions for the Intermountain Sulphur.

Determination- ***Common to all alternatives*-** The alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

WESTERN BUMBLEBEE (*Bombus occidentalis*)

Habitat information- Bumble bees inhabit a wide variety of natural, agricultural, urban, and rural habitats, although species richness tends to peak in flower-rich meandows of forests and subalpine zones. Relatively recent changes in land usage have compromised this habitat, putting pressure on bumblebee populations. In addition to habitat loss and fragmentation, overgrazing, climate change, pesticide use, competition with honey bees, and the introduction of nonnative pathogens are all thought to contribute to the population decline of all North American bumblebees. It is known to feed on sweet clover, rabbit brush, thistle, buckwheat and clover (Koch et al 2011).

Occurrence information- The Western bumble bee is rare throughout much of its range and is in decline. Historically is was found from the Pacific coast to the Colorado Rocky Mountains but has seen severe population decline west of the Sierra-Cascade Crest. In Oregon, this species has been documented on Deschutes, Fremont-Winema, Malheur, Mt. Hood, Ochoco, Rogue River-Siskiyou, Siuslaw, Umatilla, Umpqua, Willamette, and Wallow-Whitman National Forests, and BLM land in the Burns, Lakeview and Medford Districts. Given the relatively recent range contraction for this species, it is unknown what the current "Documented" status is for many of these field units, as many of the documented sites are considered historic. Surveys were conducted on the La Grande district during the summer of 2014 including within the project area. Surveys conducted on the La Grande district 2014-2015 found western bumblebees to be low in abundance, but present at about 50% of the surveyed sites. The western bumblebee was found in multiple sites within the project area.

There are a number of threats facing bumble bees which include; the spread of pests and diseases by the commercial bumble bee industry, other pests and diseases, habitat destruction or alteration (agriculture, urban development, grazing), pesticides and invasive species. The invasiveness and dominance of native grasslands by exotic plants may threaten bumble bees by directly competing with the native nectar and pollen plants that they rely on. In the absence of fire, native conifers encroach upon many meadows, which removes habitat available to bumblebees.

EFFECTS ANALYSIS

Alternative 1- Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Large stand replacing fires do have the potential to reduce available habitat in the short term for this species, though fire has been shown to be beneficial for pollinators (Panzer 2002). The impact to habitat would depend on the size and severity of the disturbance. Without active management, conifer encroachment into meadows would reduce the amount of habitat for bumblebees.

Action Alternatives (Discussion is combined because effects would be similar)- Thinning can increase gaps in the canopy which can facilitate positive understory plant diversity and cover, helping to increase food resources. Thinning over large areas should result in increased cover of understory plants which provides larger food patches with increased connectivity. However, heavy machinery can disturb and compact the soil which can have a negative effect on ground nesting bumblebees. Fire is positively correlated with plant diversity and pollinator visitation, with significant differences found in floral visitation rates between burned and unburned areas (Nuland et al.) However, prescribed fire can directly affect immature bumblebees that are confined to the nest through direct mortality. Fire can also indirectly affect bumblebees by burning litter and coarse woody debris that is used as nest sites. Proper timing of prescribed fire is important to maximize its benefits. Fall burning occurs during the mobile stage of the bumblebee life cycle and is likely to have the least negative impact (Nyoka 201). Fuels treatments would reduce the risk of stand replacing fire and encourage the return of low severity fire that can enhance meadow habitat and forb species.

Cumulative effects- Past events that affected potential Western bumblebee habitat include grazing and fire suppression and have been incorporated into the existing conditions. Previous grazing was more intensive with higher stocking levels and longer season of use than what currently occurs. Present and proposed activities within the project area with a potential to affect the Western bumblebee are continuation of the current level of livestock grazing and prescribed burning. The presence of the Western bumblebee at multiple sites within the project area indicate that the current level of grazing maintains habitat for the invertebrate. There would be no cumulative effects from selecting these alternatives because the potential direct and indirect effects would be limited to the time and location of project implementation.

Determination- ***Common to all alternatives***- The alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

FIR PINWHEEL (*Radiodiscus abietum*)

Habitat information- Most often found in moist and rocky Douglas-fir (Pseudotsuga menziesii) forest at mid-elevations in valleys and ravines (Frest and Johannes 1995a). At some Montana locations, Western red cedar (Thuja plicata) formed the canopy. Often this species is found in or near talus of a variety of rock types or under fallen logs (Pilsbry 1948, Brunson and Russell 1967, Frest and Johannes 1995b). Moist sites are preferred, low on slope or near persistent water sources, but outside of floodplains. Numerous studies suggest that gastropod abundance are positively influenced by forest age, i.e. the older the forest, the greater abundance and diversity of mollusks there are though there are other studies that contradict this finding (Jordan and Black, 2012).

Occurrence information- *Radiodiscus abietum* is known from the Blue Mountains in extreme northeastern Oregon (above Weston, Umatilla Co.); in Washington, on the Colville Ranger District of the Colville NF, Stevens County. Sixmile Creek is about 5 to 6 miles northeast of the town of Chewelah. East of the Pend Oreille River, on the Sullivan Lake Ranger District of the Colville NF; northern Idaho, and northwestern Montana (Pilsbry 1948, Frest and Johannes 1995b). In Montana, this species has been found at 13 sites in six counties: Lake, Lincoln, Mineral, Missoula, Ravalli, and Sanders. All sites are west of the Continental Divide (Brunson and Russell 1967) at elevations from 823 to 1707 m (2700-5600 ft). Requirements may be similar to *Polygyrella polygyrella*, judging by the similarity of their distributions (Hendricks, 2005).Currently surviving at several Washington sites (Frest 1995). Current status of Oregon sites unknown. Recent surveys in western Montana recorded that single live animals were found at 13 sites, with one new site (Hendricks, 2005). No surveys have been done for the fir pinwheel and it's presence within the project area is unknown. Surveys for sensitive terrestrial mollusk species are planned for 2016.

Threats- Logging and grazing over most of the known range are probably the greatest threats, through alteration of appropriate habitat. Drying of sites is considered a major concern.

EFFECTS ANALYSIS

Alternative 1- Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. The impact to habitat would depend on the size and severity of the disturbance.

Action Alternatives (Discussion is combined because effects would be similar)- Forest snails are frequently associated with old growth forests, and because of their dependency on shadiness and humidity, a stable microclimate, a sufficient amount of litter and coarse woody debris and habitat continuity, it is likely that silviculture activities that create gaps in the canopy cover and use heavy machinery within moist multi-story old growth forest would negatively affect the fir pinwheel. Research suggests that partial cuts and large group retention can help to maintain terrestrial mollusk assemblages. Alternative 2 and 5 would affect the most habitat, with 109 acres of commercial treatment proposed within moist OFMS. Alternative 4 proposes 62 acres of treatment and Alternative 3 does not propose any commercial treatment within moist OFMS. Non-commercial treatments within moist OFMS is proposed by all Alternatives. Alternatives 2 & 3 propose 214 acres, and Alternatives 4 & 5 propose 249 acres. Non-commercial treatment would not affect canopy cover and would retain more shadiness and humidity than commercial treatment, but down wood would be reduced, minimizing potential microsites for the fir pinwheel. Stands proposed for treatment have been identified as areas on the drier end of the moist spectrum where it is appropriate to move the structure toward OFSS. These drier areas are less likely to contain appropriate habitat for the fir pinwheel.

Table 2. Comparison of Old Growth Stand Structure to HRV after Proposed Treatments

Structure/PVG	HRV	Alternatives				
		1	2	3	4	5
OFMS- Moist	**15-20%**	12%	11%	12%	12%	11%

Cumulative effects- Cumulative effects for the fir pinwheel were analyzed at a project level. Past events that affected potential fir pinwheel habitat include grazing, prescribed fire and timber management and have been incorporated into the existing conditions. Previous grazing was more intensive with higher stocking levels and longer season of use than what currently occurs. Grazing can negatively influence terrestrial mollusk species. Boschi and Baur (2007) found that snail species richness and abundance decrease with grazing intensity in nutrient-poor calcareous grasslands. Due to a lack of information of the presence/absence/distribution of the fir pinwheel, it is difficult to know how past grazing has affected this species. However, cattle are less likely to disturb required habitat components (litter, woody debris, temperature) within the forest then they are within a grassland and should have a minimal effect on the fir pinwheel. Cattle could contribute to direct mortality through trampling. Numerous studies have found a negative response of gastropods to fire including reductions in abundance and species richness. Page et al (2000) and Agee (2001) recommend low-intensity burns at infrequent fire-return intervals (>5 years) in order to best maintain gastropod communities. In light of potential grazing and prescribed fire impacts, the East Face project could potentially contribute to cumulative effects to the fir pinwheel.

Determination- ***Common to all alternatives*****-** The alternatives **May Impact Individuals or Habitat (MIIH)** but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

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